

NAME: _____

Directions: Circle the letter of the answer that best completes the statement given:

1. Ionizing radiation is called "ionizing" because:
 - a. it is emitted by charged particles called ions.
 - b. it is everywhere.
 - c. we can detect it with our senses.
 - d. it produces charged particles called ions in materials it penetrates.
2. Some important forms of ionizing radiation are:
 - a. high-frequency sound waves.
 - b. gamma rays and X-rays.
 - c. microwaves and radar.
 - d. ultraviolet light from grow lamps.
3. An important form of non-ionizing radiation is:
 - a. gamma ray.
 - b. visible light.
 - c. X-ray particle.
 - d. beta particle.
4. The least penetrating form of ionizing radiation is:
 - a. alpha particles.
 - b. beta particles.
 - c. gamma rays.
 - d. electrons.
5. The highest deposit energy per unit path in human tissue is from:
 - a. alpha particles.
 - b. beta particles.
 - c. X-rays.
 - d. gamma rays.





6. A given exposure to gamma rays will have the least effect if it is received:
 - a. all at once.
 - b. in two exposures a few minutes apart.
 - c. in several exposures over a period of hours.
 - d. in several exposures over a period of weeks or months.
7. The spontaneous emission of fast-moving particles and rays by an atom is called:
 - a. atomization.
 - b. spontaneous combustion.
 - c. current emissions.
 - d. radioactivity.
8. Isotopes that spontaneously emit ionizing radiation are often called:
 - a. radiators.
 - b. radiation.
 - c. radioisotopes.
 - d. radio transmitters.
9. For people living in the United States, the average annual exposure to ionizing radiation from all sources is:
 - a. 20 millirem.
 - b. 55 millirem.
 - c. 360 millirem.
 - d. 500 millirem.
10. The average U.S. resident receives the highest percent of exposure to ionizing radiation from:
 - a. medical diagnosis and treatment.
 - b. nuclear powerplants and nuclear waste.
 - c. transportation of nuclear materials.
 - d. natural sources (rocks, soil, cosmic radiation, radon).
11. If your family found an unacceptable amount of radon present in your home, the best way to control exposure would be:
 - a. move away.
 - b. close all the doors and windows.
 - c. improve your home's ventilation.
 - d. install a humidifier in your basement.

12. Two isotopes present in the food we eat that contribute to our internal radiation exposure are:
 - a. potassium-40 and carbon-14.
 - b. tritium-234 and radon-222.
 - c. uranium-234 and thorium-230.
 - d. iodine-131 and cesium-137.

13. The half-life of a radioactive isotope is the time in which:
 - a. single radioactive atom loses half its radioactivity.
 - b. a quantity of a radioactive substance loses half its radioactivity.
 - c. a quantity of a radioactive substance loses half its mass.
 - d. a nucleus is divided in half.

14. The half-life of a radioactive isotope is the time in which it has a _____ chance of decaying.
 - a. 25%
 - b. 50%
 - c. 75%
 - d. 100%

15. People can achieve protection from exposure to radiation by:
 - a. increasing length of time of exposure.
 - b. decreasing distance from the source.
 - c. increasing shielding.
 - d. decreasing shielding.

16. Which of the following best represents a gamma ray?
 - a. 
 - b. 
 - c. 
 - d. 

17. We assume that there is some risk even for low exposures to ionizing radiation because:
 - a. there are a lot of data that show that there is an effect.
 - b. we cannot prove that there is no effect.
 - c. no other substances cause similar effects.

- d. effects of high exposures prove effects at low exposures.
18. Which of the following does **NOT** travel at the speed of light?
- a. beta particle.
 - b. radar.
 - c. visible light.
 - d. radio wave.
19. There is general agreement among scientists about the effects on the body from:
- a. both high and low exposures to ionizing radiation.
 - b. neither high nor low exposures to ionizing radiation.
 - c. high exposures to ionizing radiation received in a short time.
 - d. low exposures to ionizing radiation received over a long time.
20. The process in which an atom emits particles and is transformed into a different element is:
- a. spontaneous decay.
 - b. random decay.
 - c. transformation.
 - d. radioactive decay.

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|--------------|--------------|
| 1. <u>D</u> | 11. <u>C</u> |
| 2. <u>B</u> | 12. <u>A</u> |
| 3. <u>B</u> | 13. <u>B</u> |
| 4. <u>A</u> | 14. <u>B</u> |
| 5. <u>A</u> | 15. <u>C</u> |
| 6. <u>D</u> | 16. <u>D</u> |
| 7. <u>D</u> | 17. <u>B</u> |
| 8. <u>C</u> | 18. <u>A</u> |
| 9. <u>C</u> | 19. <u>C</u> |
| 10. <u>D</u> | 20. <u>D</u> |